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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,808

11/12/2003

Blake A. Simmons

SANDIA-2 (SD-8485)

7853

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EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT

PAPER NUMBER

1732

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/712,808

Applicant(s)

SIMMONS ET AL.

Examiner

Jeff Wollschlager

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10,11,22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10,11,22 and 23 is/are rejected.
- 7) ☒ Claim(s) 1,2,4-8,10,11,22 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment to the claims and specification filed February 22, 2007 has been entered. Claims 1, 2, 4-8, 10 and 11 are currently amended. Claims 22 and 23 are new. Claims 3 and 9 have been canceled. Claims 1, 2, 4-8, 10, 11, 22 and 23 are currently pending and under examination.

### ***Claim Objections***

Claims 1, 2, 4-8, 10, 11, 22 and 23 are objected to for the following informalities:

The claims recite, for example in line 6 of claim 1, "workpiece within said first workpiece". The claims would be more readable if the same/similar limitations throughout the claims were presented as "workpiece and is within said first workpiece". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 7, 8, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Unger et al. (U.S. Patent Application Publication 2001/0054778).

Regarding claims 1, 2 and 22, Unger et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a first

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polymerizable material, wherein said first surface diffusion zone is adjacent a first surface of a first workpiece; b) creating a second surface diffusion zone containing therein a second polymerizable material, wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece, and wherein said first polymerizable material and said second polymerizable material are capable of bonding with each other; and, c) bringing said first surface and said second surface into intimate contact at a bonding surface; and d) causing said first polymerizable material and said second polymerizable material to react and join across said bonding surface (Abstract; paragraphs [0012, 0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs [0007, 0010]).

Regarding claims 7, 8 and 23, Unger et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a polymerizable material, wherein said first surface diffusion is adjacent to a first joining surface of a first workpiece; and, b) providing a second workpiece having a second joining surface; and, c) bringing said first joining surface and said second joining surface into intimate contact at a bonding surface; and, d) causing said polymerizable material to react and join across said bonding surface (paragraphs [0012, 0141, 0142, 0147, 0148]). Unger et al. teach at least one of said surfaces contains at least one microfeature (Title, paragraphs [0007, 0010]).

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Claims 1, 2, 7, 8, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Soane et al. (U.S. Patent 6,176,962).

Regarding claims 1, 2 and 22, Soane et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a first polymerizable material, wherein said first surface diffusion zone is adjacent a first surface of a first workpiece; b) creating a second surface diffusion zone containing therein a second polymerizable material, wherein said second surface diffusion zone is adjacent to a second surface of a second workpiece, and wherein said first polymerizable material and said second polymerizable material are capable of bonding with each other; and, c) bringing said first surface and said second surface into intimate contact at a bonding surface; and d) causing said first polymerizable material and said second polymerizable material to react and join across said bonding surface (Abstract; col. 3, lines 13-18 and 47-50; col. 7, lines 20-28; col. 8, lines 11-18 and 25-27 and 35-39; col. 10, lines 4-26; col. 11, lines 57-col. 12, line 6; col. 13, lines 46-49; col. 14, lines 9-11). Soane et al. teach at least one of said surfaces contains at least one microfeature (Abstract).

Regarding claims 7, 8 and 23, Soane et al. teach a method of joining plastic comprising: a) creating a first surface diffusion zone containing therein a polymerizable material, wherein said first surface diffusion is adjacent to a first joining surface of a first workpiece; and, b) providing a second workpiece having a second joining surface; and, c) bringing said first joining surface and said second joining surface into intimate contact at a bonding surface; and, d) causing said polymerizable material to react and join

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across said bonding surface (Abstract; col. 3, lines 13-18 and 47-50; col. 7, lines 20-28; col. 8, lines 11-18 and 25-27 and 35-39; col. 10, lines 4-26; col. 11, lines 57-col. 12, line 6; col. 13, lines 46-49; col. 14, lines 9-11). Soane et al. teach at least one of said surfaces contains at least one microfeature (Abstract).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4-6, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soane et al. (U.S. Patent 6,176,962) as applied to claims 1, 2, 7, 8, 22 and 23 above, and further in view of Kawazoe et al. (WO 03/070623) and/or Stokich et al. (U.S. Patent 6,184,284) and/or White et al. (U.S. Patent 4,824,500).

It is noted that U.S. Patent Application Publication 2005/0249637 is employed as the English translation of WO 03/070623. Citations to Kawazoe et al. are drawn from the U.S. Publication.

Regarding claims 4-6, 10 and 11, Soane et al. teach the method as discussed in the 102(b) rejection above. Soane et al. do not explicitly elaborate as to all the combinations of conventional plastics and conventional polymerizable materials that may be employed. However, in analogous joining/bonding methods, Kawazoe et al, Stokich et al., and White et al. each taken individually or in combinations with each other teach and suggest the claim limitations.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ the conventional polymers and conventional polymerizable materials, as taught and suggested by Kawazoe et al, Stokich et al., and White et al., together with the method of Soane et al. for the purpose as taught by Kawazoe et al. of making a product suited for its purpose (paragraph [0034]), or as taught by White et al. for providing a binder which cures at low temperatures and has the required cure strength (col. 1, lines 46-51) or as taught by Stokich et al. to provide an adhesion promoter which reduces water absorption (col. 1, lines 38-59).

Specifically, as to claims 4 and 10, Kawazoe et al., for example, show the known equivalence of PMMA, as specifically employed by Soane et al., with PEEK, PPS, and PEI (paragraphs [0030, 0034]), in similar microfluidic applications. As suggested by

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Kawazoe et al, the ordinarily skilled artisan would choose the material "depending on a purpose" (paragraph [0034]).

As to claims 5 and 11, Stokich et al. (col. 1, lines 65- col. 2, lines 4; col. 2, lines 17-35 and 46-52; col. 14, lines 11-20; col. 15, lines 28-43) and White et al. (col. 5, lines 40-57; and col. 8, lines 8-14) for example, disclose that various polymers may be employed, and styrene and divinylbenzene, alone or together, may be employed as polymerizable materials.

As to claim 6, White et al., for example, employ styrene and divinylbenzene analogously in a ratio of 9:1 (col. 8, lines 6-14).

Claims 4-6, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Unger et al. (U.S. Patent Application Publication 2001/0054778) as applied to claims 1, 2, 7, 8, 22 and 23 above, and further in view of Kawazoe et al. (WO 03/070623) and/or Stokich et al. (U.S. Patent 6,184,284; issued February 6, 2001) and/or White et al. (U.S. Patent 4,824,500).

It is noted that U.S. Patent Application Publication 2005/0249637 is employed as the English translation of WO 03/070623. Citations to Kawazoe et al. are drawn from the U.S. Publication.

Regarding claims 4-6, 10 and 11, Unger et al. teach the method as discussed in the 102(b) rejection above. Unger et al. do not explicitly elaborate as to all the combinations of conventional plastics and conventional polymerizable materials that may be employed. However, in analogous joining/bonding methods, Kawazoe et al,

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Stokich et al., and White et al. each taken individually or in combinations with each other teach and suggest the claim limitations.

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ the conventional polymers and conventional polymerizable materials, as taught and suggested by Kawazoe et al, Stokich et al., and White et al. together with the method of Unger et al. for the purpose as taught by Kawazoe et al. of making a product suited for its purpose (paragraph [0034]), or as taught by White et al. for providing a binder which cures at low temperatures and has the required cure strength (col. 1, lines 46-51) or as taught by Stokich et al. to provide an adhesion promoter which reduces water absorption (col. 1, lines 38-59).

Specifically, as to claims 4 and 10, Kawazoe et al., for example, show the known equivalence of PMMA, as specifically employed by Kawazoe et al., with PEEK, PPS, and PEI (paragraphs [0030, 0034]), in similar microfluidic applications. As suggested by Kawazoe et al, the ordinarily skilled artisan would choose the material "depending on a purpose" (paragraph [0034]).

As to claims 5 and 11, Stokich et al. (col. 1, lines 65- col. 2, lines 4; col. 2, lines 17-35 and 46-52; col. 14, lines 11-20; col. 15, lines 28-43) and White et al. (col. 5, lines 40-57; and col. 8, lines 8-14) for example, disclose that various polymers may be employed, and styrene and divinylbenzene, alone or together, may be employed as polymerizable materials.

As to claim 6, White et al., for example, employ styrene and divinylbenzene analogously in a ratio approximately 9:1 (col. 8, lines 6-14).

### ***Response to Arguments***

Applicant's arguments filed February 22, 2007 have been fully considered, but they are not persuasive.

#### **Applicant's arguments appear to be on the following grounds:**

1. Unger does not describe the creation of a surface diffusion zone. Even assuming that a reasonable equivalent to a surface diffusion zone may occur in the case of chemical bonding between adjacent layers in one or more of Unger's workpieces this is insufficient to render Unger anticipating prior art.

2. Since the amended claims recite removal of excess polymerizable material, should any be present, neither a thermal bonding nor an adhesive layer bonding method, such as those disclosed by Soane, can be used to reject the claims. This is an important feature of the instant invention supported by the specification.

#### **The arguments are not persuasive for the following reasons:**

1. Unger has polymerizable material "in" (paragraphs [0141-0143]) the layers to be bonded and these layers are bonded to form a "monolithic" substrate. The location of the unreacted polymerizable material in each of the individual layers that react to form the monolithic structure is reasonably understood to be a surface diffusion zone. This interpretation is further supported by paragraph [0031] of the instant specification, US2005/0100712, wherein it is stated that: "The workpiece may be initially formed with polymerizable material included therein during the formation process". In any event, the

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teaching of Unger is reasonably understood to "create a surface diffusion zone". As set forth above in the rejection of claims 1 and 7, all the claim limitations are met by Unger. It follows that Unger anticipates claims 1 and 7.

2. The examiner notes that the claim limitation states "removing excess" material "if present" and does not limit the claim to the extent argued. The claims do not recite, for example "removing all of said first polymerizable material from said first surface, if any is present;".

The examiner notes that the limitation "if present, removing excess..." is reasonably interpreted as essentially meaning/saying: "removing any amount of the first polymerizable material from the first surface that is more than the amount desired to remain on the first surface" and is not limited to "removing all" as suggested in the arguments or even removing anything at all.

Regarding the important nature of the argued feature, it is noted that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., no polymerizable material on the surface of the workpiece) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager  
Examiner  
Art Unit 1732

May 3, 2007

  
CHRISTINA JOHNSON  
SUPERVISORY PATENT EXAMINER

5/11/07